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Plum Growing in Maryland

By F. S. Holmes.

The Maryland Agricultural Experiment Station

COLLEGE PARK, MD.

MAY, 1917.

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THE MARYLAND AGRICULTURAL EXPERIMENT STATION

BULLETIN No. 207 MAY, 1917

PLUM GROWING IN MARYLAND.

By F. S. Holmes.

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INTRODUCTION.

Station publications on various phases of fruit growing, particularly those relating to peach and apple culture, have been available for many years. While plums are of minor importance in comparison with apples and peaches, their culture is of considerable interest to a large number of persons throughout Maryland. The publication of information concerning them though somewhat similar to that already available regarding other fruits is therefore believed to be justifiable at this time. The small fruit grower is often more in need of assistance than the man who has a large commercial orchard.

PLUM GROWING IN MARYLAND.

The cultivation of plums in Maryland is neither extensive in scope nor intensive in character. There are no commercial plantings of importance. Home plantings are not unusual, however, and are more or less evenly distributed throughout the State. This can be accounted for by the fact that plums are so cosmopolitan in character that they can be grown more readily than many fruits under such varied soil and climatic conditions as those that prevail in Maryland.

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Distribution of Trees and Production of Fruit.

On account of the meagerness of the available information a clear idea of the exact state of the plum growing industry of Maryland cannot be formed without considerable study. With the help of a number of correspondents and data of the Census Bureau and the Bureau of Crop Estimates a fairly accurate picture of it is possible, however. In succeeding paragraphs an attempt is made to present this information in such form as will make it most useful.

The State as a Whole.

The relative extent and importance of plum growing in comparison with other orchard fruits is shown in Table I. The number of trees, approximately seventy thousand, is exceeded by every fruit except quinces which are never thought of as being commercially important in Maryland. The data for Table I were derived from the figures of the Thirteenth Census of the United States, 1910. It should be borne in mind, in connection with Tables I, II, III and IV, that data of the number of trees are for April 15th, 1910, and data of production are for the season of 1909. The figures for production of fruit

TABLE I.

Number of fruit trees of bearing age in Maryland in 1910; production and value of fruit in 1909.

	Whole Number.	No. Per 100 Acres Improved Land.	Number Per Farm.	Production	Production. Per Tree.	Value.
				Bushels	*Bushels*	*Dollars*
Apples	1,288,482	38.41	26.34	1,822,824	1.41	902,077
Peaches and Nectarines	1,497,724	44.64	30.61	324,609	0.22	361,617
Pears	540,583	16.11	11.05	367,359	0.68	168,561
Plums and Prunes.	69,996	2.09	1.43	13,526	0.19	16,192
Cherries	82,305	2.45	1.68	42,315	0.51	60,121
Quinces	20,936	0.62	0.43	6,359	0.30	8,383

per tree are inaccurate to the extent of the difference between the number of trees of bearing age at the two times. In view of the fact that plum growing was decreasing in the State as a whole at the time of the taking of the census, the production of plums per tree should be less than .19 of a bushel for the year 1909 as shown in Table I. It should be remembered, however, that figures of production for a single season may be very different from the average for a series of years. While no information is available as to how the plum crop of 1909 compared with the average of the crop for preceding and subsequent years, the peach crop for that year, according to figures of the Bureau of Crop Estimates, of the United States Department of Agriculture, was approximately four-fifths of that of the average for the twenty-year period from 1894 to 1913. The

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plum crop of 1909 probably differed very little in the percentage of a full crop from that of the peach crop of the same year. On this basis, the best available, the annual plum crop of Maryland averages a peck per tree. That this average is lower than it should be will be universally admitted.

The Three Geophysical Provinces.

The State may be divided into three rather well-defined sections. The first of these, the Appalachian, extends from the western boundary of the State to the foot of the eastern slope of Catoctin Mountain in Frederick County. This region is commonly known as Western Maryland. The second of these divisions, the Piedmont Plateau, extends from the eastern boundary of Western Maryland eastward to the "fall line" which runs in a generally northeasterly direction from the southeastern corner of Montgomery County to near the middle of the eastern boundary of Cecil County. The third division, the Coastal Plain, comprises the remainder of the State. This section includes what is commonly known as the Eastern Shore and Southern Maryland.

TABLE II.

Number of plum trees of bearing age by geophysical provinces of Maryland 1910; production of fruit in 1909.

Province.	Whole Number.	No. Per 100 Acres Improved Land.	Number Per Farm.	Production.	Production Per Tree.
				Bushels	*Bushels*
Appalachian.....	18,332	3.78	2.68	3,866	.21
Piedmont Plateau.....	21,402	1.91	1.36	5,840	.27
Coastal Plain.....	30,262	1.73	1.15	3,820	.13

The whole number of trees, the number per one hundred acres of improved land, the number per farm, the total production, and the production per tree for each of these provinces are shown in Table II. On the basis of the amount of improved land and the number of farms, the number of plum trees falls off uniformly from the western to the eastern section of the State. The production per tree, however, was highest in the Piedmont Plateau province, though that of the Appalachian province is higher than that of the Coastal Plain province.

The Counties.

Data similar to those of Table II for the twenty-three counties of the State are given in Tables III and IV. The range of values of each item is much greater, of course, in Table III and IV than in Table II. The whole number of trees in a county is of little value for purposes of comparison on account of variations in their area. The number per 100 acres of improved land and the number per farm,

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TABLE III.

Distribution of Plum Trees of Bearing Age by Counties in Maryland in 1909 According to the Whole Number, the Number Per 100 Acres of Improved Land, and the Number Per Farm.

	Whole Number.			Number Per 100 Acres of Improved Land.			Number Per Farm.		
1	Frederick	P*	6246	Allegany	A	8.58	Allegany	A	5.92
2	Baltimore	P	6151	Caroline	C	4.73	Caroline	C	2.85
3	Caroline	C	6063	Garrett	A	4.10	Garrett	A	2.42
4	Allegany	A	6055	Prince George's	C	3.15	Kent	C	2.26
5	Carroll	P	5206	Washington	A	2.69	Prince George's	C	2.13
6	Washington	A	5172	Baltimore	P	2.66	Washington	A	2.10
7	Garrett	A	5020	Carroll	P	2.30	Frederick	P	1.64
8	Prince George's	C	4866	Anne Arundel	C	2.14	Howard	P	1.57
9	Anne Arundel	C	2974	Frederick	P	2.07	Carroll	P	1.49
10	Harford	P	2784	Howard	P	1.91	Baltimore	P	1.47
11	Montgomery	P	2537	Kent	C	1.77	Anne Arundel	C	1.46
12	Kent	C	2474	Somerset	C	1.63	Harford	P	1.11
13	Howard	P	2181	Harford	P	1.62	Charles	C	1.05
14	Charles	C	1698	Charles	C	1.39	Montgomery	P	1.04
15	Worcester	C	1638	Worcester	C	1.34	Talbot	C	0.89
16	Dorchester	C	1465	Wicomico	C	1.28	Cecil	P and C	0.71
17	Wicomico	C	1392	Montgomery	P	1.21	Worcester	C	0.70
18	Somerset	C	1247	Dorchester	C	1.18	Calvert	C	0.69
19	Cecil	P and C	1224	Calvert	C	1.01	Dorchester	C	0.66
20	Talbot	C	1159	Talbot	C	0.99	Somerset	C	0.63
21	Saint Mary's	C	896	Saint Mary's	C	0.91	Queen Anne's	C	0.56
22	Queen Anne's	C	795	Cecil	P and C	0.87	Saint Mary's	C	0.55
23	Calvert	C	750	Queen Anne's	C	0.46	Wicomico	C	0.52

*In this and the following table that one of the three geophysical provinces of the State, the Appalachian, the Piedmont Plateau, and the Coastal Plain, in which a county most largely lies is indicated by the letter A, P, or C, respectively.

however, furnish comparable data for the number of trees in different counties. The number of trees of bearing age per 100 acres of improved land varies from 8.58 for Allegany County to 0.46 for Queen Anne's County, being more than eighteen times greater in the former than in the latter. The increasing number of counties lying within the Coastal Plain as we proceed down the columns is striking. One county of that province, Caroline, is an exception, however, standing third in the whole number of trees and second in both the number per 100 acres of improved land and the number per farm. No other county of that section stands nearly so high. Since climatic, soil, and market conditions within this region are comparatively uniform, another reason for this high standing must be sought. It is found in the fact that Caroline County was the home of the late J. W. Kerr, of Denton. It would hardly be possible for so well-known a figure in the plum world not to exert an influence upon his neighbors. In the number of trees per farm, Allegany again heads the list with 5.92. Wicomico is at the foot of the list with only 0.52. The extremes do not differ so much as is the case in the number per 100 acres of improved land, but still there are more than eleven times as many per farm in Allegany as there are in Wicomico.

As pointed out for similar data of Table I it must be borne in mind that the plum crop of 1909 was probably about four-fifths of an

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TABLE IV.

Production of Plums by Counties in Maryland in 1909 According to the Number of Bushels, and the Fractions of a Bushel Per Tree of Bearing Age.

Number of Bushels.				Fractions of a Bushel Per Tree of Bearing Age.		
1	Baltimore	P*	2015	Baltimore	P	.33
2	Carroll	P	1637	Carroll	P	.31
3	Garrett	A	1500	Garrett	A	.30
4	Washington	A	1364	Howard	P	.30
5	Frederick	P	1085	Montgomery	P	.29
6	Anne Arundel	C	856	Anne Arundel	C	.29
7	Montgomery	P	738	Cecil	P and C	.27
8	Howard	P	651	Washington	A	.26
9	Allegany	A	641	Charles	C	.24
10	Harford	P	550	Talbot	C	.20
11	Prince George's	C	489	Harford	P	.20
12	Charles	C	403	Saint Mary's	C	.19
13	Cecil	P and C	330	Frederick	P	.17
14	Talbot	C	233	Queen Anne's	C	.16
15	Caroline	C	232	Calvert	C	.14
16	Dorchester	C	201	Dorchester	C	.14
17	Saint Mary's	C	174	Allegany	A	.11
18	Queen Anne's	C	128	Prince George's	C	.10
19	Calvert	C	105	Kent	C	.04
20	Kent	C	100	Caroline	C	.04
21	Somerset	C	45	Somerset	C	.04
22	Wicomico	C	29	Wicomico	C	.02
23	Worcester	C	20	Worcester	C	.01

*In this and the preceding table that one of the three geophysical provinces of the State, the Appalachian, the Piedmont Plateau, and the Coastal Plain, in which a county most largely lies is indicated by the letter A, P, or C, respectively.

average crop, or about one-third of a full crop. Even so, the crop was a very light one particularly in the eastern part of the State as is shown also in Table II. Allegany standing at the head of the list in Table III drops to seventeenth place in Table IV. In the production per tree the counties of the Appalachian and the Piedmont Plateau provinces head the list with few exceptions.

Decline.

While Tables I, II, III and IV give a clear picture of the plum industry of the State in 1910 data are not available for the construction of such tables for this time. Of one thing we are sure, though; that the industry is on the decline throughout the entire State. The present decline seems to have begun on the Eastern Shore before the taking of the last census and extended westward, reaching the extreme western portion of the State within the past three or four years. The industry itself, like peach growing, spread westward and it was only natural that its decline should do the same.

There are a number of reasons which account for this condition and it is rather difficult to correctly evaluate them. The prin-

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cipal ones stand out quite clearly, however, and it will be profitable to give them some consideration before attempting to outline the things necessary for rehabilitating the industry.

Low Prices.

The great majority of plum growers of past years ascribe the decline of the industry to the low prices received. That the prices received have been low cannot be denied. There are, in turn, a number of causes for the low prices which have prevailed. Some of these causes are very largely, if not entirely, beyond the control of the grower; others are within his control if he will only recognize the fact and do what he can to overcome them. The competition with peaches is one of the causes of low prices. The best way of meeting this condition is to grow the early varieties which will get upon the market before the bulk of the peach crop. Another cause of low prices is the low quality of the plums offered for sale. Still another is the careless manner in which the fruit is often picked and packed.

It is difficult to sharply differentiate the exact manner in which causes have operated to bring about a decline in plum growing, however. Unsuitable varieties may be either unproductive though bringing a good price, or productive while commanding only a low price. Unfortunately it was not uncommon for many varieties formerly planted to be both unproductive and bring a low price as well.

Unsuitable Varieties.

There has always been a large number of worthless varieties of plums planted and of course the planting of such varieties ultimately hurts the industry. Fifteen or twenty years ago there was a "boom" in plum growing caused by the introduction of a large number of Japanese varieties and their hybrids. A great many of these much-advertised varieties which were either of no value anywhere or unsuited to Maryland's climatic and soil conditions were widely planted in the State. The baneful effects of this "boom" may be seen to this day.

Fungous Diseases and Insects.

The serious losses occasioned by fungous diseases and insect pests have contributed materially to the decline of plum growing within the last few years. This is not true of either apples or peaches because these fruits are grown commercially and the commercial growers have been forced to fight these pests. Plums, on the other hand, are grown almost entirely for home use, and the general farmer, as a rule, knows nothing regarding the control of either fungous diseases or insect pests, or if he does, he thinks it not worth while. As a consequence plums are allowed to become infested with all kinds of diseases and pests. There are only two really serious plum pests—brown, or ripe, rot and the curculio. All other diseases and

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insects are readily controlled and yet black knot and San Jose scale have been allowed to destroy large numbers of plum trees. Losses ascribed to either should be charged to neglect instead. If proper varieties are grown, and these are intelligently cared for, including thinning and thorough spraying, losses from any of the above mentioned causes should seldom be serious.

There can be no doubt that plums may be successfully grown throughout the State, but that their growing is decreasing for the reasons mentioned above is also beyond doubt.

Varieties.

The most widely planted varieties in the state at this time in decreasing order are Abundance, Shropshire and Burbank. Other varieties less widely planted are Wild Goose, Red June, Lombard, German Prune, Satsuma, Shipper and Green Gage. Shropshire is the most widely planted plum in Western Maryland. Lombard and Shropshire seem to be about evenly planted, and the leading varieties of the Piedmont section. Abundance leads all other varieties by a good margin in the Coastal Plain. It is followed by Wild Goose and Burbank which seem very evenly matched as to the extent to which they are grown in this region. From the reports of correspondents it seems that Wild Goose is not at all widely grown outside of the Coastal Plain region. Shropshire is the only European variety grown to any extent in the Coastal Plain counties.

In some cases, these varieties may be considered a "survival of the fittest." In others, they are only the remnants of over-advertised varieties planted a few years ago. More attention will be given to the question of varieties under the subject of those recommended for planting in the State.

VARIETIES TESTED AT THE STATION.

The ideal method of testing varieties of fruit for Maryland would be to grow them at points throughout the State which would be representative of all the principal soil and climatic combinations to be found. As this is manifestly impossible, we must rely upon such tests as are practicable. Usually these consist entirely of those made at the Experiment Station. In this instance, however, the results of the variety tests of the late W. J. Kerr, of Denton, are available. His conclusions as to the varieties suitable for growing in the State are embodied in the discussion of those recommended for planting. (See pages 321 to 324.)

Object of the Tests.

The Station plum orchard which it has been necessary to remove within the year was planted in the spring of 1903, with the twofold object of furnishing representative types of the various groups of plums and of testing a number of the more promising varieties.

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The Station Orchard.

Native, Japanese and hybrid plums were well represented in the collection. As planted, the orchard included twenty-six Native varieties, sixteen Japanese varieties, thirty-two hybrids, and two Europeans; a total of seventy-six varieties. Two or more trees of each variety were planted. Trees died from time to time from various causes and their places were filled with various kinds of fruit trees but not in such a way, however, as to interfere with the adjoining plums.

The orchard site was immediately south of the new College Greenhouses. The ground to the north and east is somewhat higher and the orchard site itself slopes very gently to the southwest. The air and the soil drainage are fairly good.

The soil is a sandy and gravelly loam with a stiff clay subsoil, classified by the Bureau of Soils of the United States Department of Agriculture as Susquehanna clay loam. It is of medium fertility.

There were eight rows of twenty-six trees which ran from north to south. The trees were planted in eighteen-foot squares. This distance proved too close for some of the larger, spreading varieties and made their handling very difficult. If the orchard is to be sprayed with a power sprayer this distance should be the minimum for planting all varieties and twenty to twenty-five feet would be preferable.

The orchard was given the usually recommended cultural care, including spraying, cultivation, and sowing of cover crops. Cultivation usually consisted of frequent harrowings from early spring till about the middle of July. A cover crop of crimson clover was nearly always sown at this time. If it was not sown, a crop of weeds and grass spontaneously covered the ground before the end of the growing season. The growth of the trees as a whole was very satisfactory and the conditions for testing the relative value of the different varieties were good.

Blooming Data.

A knowledge of the time of blooming of orchard fruits of all kinds is of considerable value to the fruit grower. The time of blooming determines the time of application of one or more sprayings. Varieties which bloom very early are more likely to be injured by spring frosts and should either not be planted or planted in the most favorable location with reference to such injury. As a rule plums must be cross-pollinated in order to insure the setting of a crop of fruit. Cross-pollination not only must be provided for by planting different varieties, but they must bloom at about the same time as well.

With these thoughts in mind Tables V and VI were prepared. In table V all the varieties for which blooming data were secured are arranged in the order in which they come into full bloom. Table VI is similarly arranged by groups and also includes the average for the group. As the observations do not cover the same years for the

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different varieties in all cases relative blooming dates, as given in the tables, are not always strictly correct. The years in which observations were made are shown for each variety, however, and it is thus possible to know the varieties for which the data are strictly comparable. It should be mentioned in this connection that dates for 1907, 1908, and 1909 are very nearly averages for the period covered. Dates for 1913 average two weeks earlier than the mean for the six years; those for 1914, one week late; and those for 1915, four days late.

The blooming period for all varieties extends over about one month. Normally this is the month of April. The blooming of Japanese varieties extends over the first half of the month. Roughly speaking, the native varieties are in bloom the last half of the month. Hybrids bloom during the entire blooming period; beginning with the earliest of the Japanese and ending with the hortulanos. The normal season of blooming for a given variety of plums for the entire state extends over a period of about three weeks. Blooming begins very nearly simultaneously in the eastern part of the state and becomes later as the higher elevations are reached. The elevation above sea level of the Station plum orchard was about 125 feet.

As pointed out in a previous paragraph, table VI shows the blooming period of Japanese varieties to extend over a period of about two weeks. It is worthy of special note that of the four leading varieties of the group, two, Abundance and Burbank, come into full bloom ten days before the other two, Chalot and Red June, respectively. The additional ten days of dormancy of the latter two is a real advantage in many locations where spring frosts are likely to kill the blossoms. Maru, blooming two days later than Red June, was the only one of the group to escape the spring frost in 1914. Unfortunately, nothing else can be said in favor of this variety.

The time of blooming of the Native varieties does not extend over so long a period of time; all of them coming into full bloom within nine days. The earliest of the Native varieties come into full bloom approximately the same time as the latest of the Japanese varieties. The hortulana varieties, it will be noted by an inspection of Table V or VI, are the latest blooming of all the plums grown here.

Naturally the hybrids vary greatly in their time of blooming. The two most valuable varieties of the hybrids, America and Gonzales, come into full bloom at the same time as Red June, about the midst of the blooming season.

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TABLE V.

Blooming Data of Plums Grown in the Station Orchard. Varieties Arranged in the Order in Which They Come Into Full Bloom.

	Prunus Species.	Observations for the Years	First Bloom	Full Bloom	Last Bloom
Berckmans	Triflora	'07, '08, '13, '15	3-24	3-31	4-4
Abundance	Triflora	'07, '08, '09, '13	3-25	3-31	4-4
Climax	Triflora X Simonii	'07, '08, '13	3-25	3-31	4-5
Hale	Triflora	'07, '08, '13	3-26	3-31	4-6
Chalco	Simonii X Triflora	'07, '08, '13	3-28	3-31	4-6
Apple	Triflora X (?)	'07, '08, '09, '13, '15	3-26	4-1	4-6
Burbank	Triflora	'07, '08, '13, '15	3-27	4-1	4-5
Occident	Triflora	'07, '08, '13, '15	3-25	4-2	4-7
Nona	Triflora X Munsoniana	'07, '08, '13	3-27	4-2	4-7
Kelmyro	Triflora X Cerasifera	'07, '08, '13, '15	3-28	4-2	4-8
Doris	Uncertain	'07, '08, '13, '15	3-29	4-2	4-8
Kelbalan	Triflora X Cerasifera	'07, '08, '13, '15	3-28	4-4	4-8
Wickson	Triflora X Simonii	'07, '08, '09, '13, '15	3-28	4-4	4-8
Satsuma	Triflora	'08, '09, '13, '15	3-30	4-4	4-8
Weeping Blood	Triflora	'13, '15	3-30	4-4	4-8
Bartlett	Triflora X Simonii	'07, '08, '13	3-30	4-5	4-10
Ragland	Triflora X Angustifolia Varians	'07, '08, '13, '15	4-1	4-6	4-10
Red October	Uncertain	'07, '08, '13	4-1	4-6	4-10
Engree	Triflora	'07, '08, '13	4-2	4-6	4-12
Kelsey	Triflora, '08	'08, '13, '15	4-2	4-6	4-12
Combination	Triflora X (?)	'07, '08, '13, '15	3-30	4-7	4-14
Kelroba	Triflora X Cerasifera	'07, '08, '13, '15	4-1	4-7	4-10
First	Triflora X (?)	'07, '08, '13, '14, '15	4-4	4-7	4-12
Shiro	Simonii X Triflora	'07, '08, '13, '14, '15	4-2	4-8	4-13
Kerr	Cerasifera X munsoniana Triflora	'07, '08, '13, '14, '15	4-3	4-8	4-12
Waugh	Triflora X Hortulana	'07, '08, '13, '15	4-4	4-8	4-12
Georgeson	Triflora	'07, '08, '13, '14, '15	4-4	4-8	4-15
Yates	Triflora X Angustifolia Varians	'07, '08, '13, '15	4-4	4-9	4-14
Chabot	Triflora	'07, '08, '13, '14, '15	4-5	4-9	4-13
Gonzales	Triflora X (?)	'07, '08, '13, '14, '15	4-5	4-10	4-16
America	Munsoniana X Triflora	'07, '08, '13, '14, '15	4-5	4-10	4-17
Red June	Triflora	'13, '14, '15	4-6	4-10	4-14
Six Weeks	Triflora X Angustifolia Varians	'07, '08, '13, '14, '15	4-6	4-11	4-18
Ogon	Triflora	'07, '08, '13, '14, '15	4-7	4-11	4-17
Golden	Munsoniana X Triflora	'07, '08, '13, '15	4-7	4-11	4-18

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TABLE V—(*Continued*)

	Prunus Species.	Observations for the Years	First Bloom	Full Bloom	Last Bloom
Maru	Triflora	'07, '08, '13, '14, '15	4-8	4-12	4-18
Delaware	Triflora	'07, '08, '13, '15	4-8	4-14	4-19
Excelsior	Triflora X Munsoniana	'08, '13, '14, '15	4-10	4-14	4-19
Holland	Triflora X Angustifolia Varians	'08, '13, '14, '15	4-10	4-14	4-20
Newman	Munsoniana	'07, '08, '13, '14, '15	4-10	4-15	4-21
Munson	Angustifolia Varians	'07, '08, '13, '14, '15	4-11	4-15	4-22
Marianna	Cerasifera X (?)	'07, '08, '13, '14, '15	4-12	4-16	4-20
Preserver	Triflora X Angustifolia Varians	'07, '08, '13, '14, '15	4-12	4-16	4-21
Duke	Munsoniana X (?)	'07, '08, '13	4-11	4-17	4-21
Strawberry	Angustifolia Watsoni	'07, '08, '13, '14, '15	4-11	4-17	4-23
Milton	Munsoniana X (?)	'07, '08, '13, '14, '15	4-12	4-17	4-20
Dunlap	Hortulana	'07, '08, '13	4-12	4-17	4-22
Whitaker	Munsoniana	'07, '08, '13, '14, '15	4-13	4-17	4-23
Shipper	Domestica	'13, '14, '15	4-15	4-17	4-22
McCartney	Angustifolia Varians	'07, '08, '13, '14, '15	4-13	4-18	4-22
Wild Goose	Munsoniana	'07, '08, '13, '14, '15	4-13	4-18	4-24
Yellow Transparent	Angustifolia Varians	'07, '08, '13, '14, '15	4-14	4-18	4-23
Maquoketa	Hortulana Mineri	'07, '08, '13	4-12	4-19	4-25
Goose Dye	Munsoniana X Cerasus	'07, '08, '13, '14	4-13	4-19	4-24
Cheney	Nigra	'07, '08	4-13	4-19	4-25
Forest Rose	Hortulana Mineri	'07, '08, '13	4-13	4-19	4-25
Idall	Munsoniana X Hortulana Mineri	'08	4-12	4-20	4-24
Goose O	Munsoniana X Triflora	'07, '08, '13, '14, '15	4-14	4-20	4-25
Smith Red	Nigra (?)	'08	4-14	4-20	4-25
Lone Star	Angustifolia Varians	'07, '08, '13, '14, '15	4-15	4-20	4-25
Smiley	Munsoniana	'07, '08, '14, '15	4-16	4-20	4-25
Cleveland	Munsoniana	'07, '08, '13, '14, '15	4-16	4-20	4-26
Shropshire	Insititia	'13, '14, '15	4-17	4-21	4-26
Brittlewood	Americana	'07, '08, '13, '14, '15	4-17	4-22	4-27
Nebraska	Hortulana Mineri	'07, '08, '13, '14, '15	4-17	4-22	4-27
Wayland	Hortulana	'07, '08, '13, '14, '15	4-17	4-22	4-27
Prairie Flower	Hortulana Mineri	'07, '08, '13, '14, '15	4-17	4-22	4-28
Golden Beauty	Hortulana	'07, '08	4-19	4-23	4-27
Reed	Hortulana	'07, '08	4-19	4-23	4-27
Cumberland	Hortulana	'07, '08	4-19	4-23	4-28

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TABLE VI.

Blooming Data of Plums Grown in the Station Orchard. Varieties Grouped According to Species and Sub-Species and Those of Each Group Arranged in the Order in Which They Come Into Full Bloom.

	Observations for the Years	First Bloom	Full Bloom	Last Bloom
	PRUNUS DOMESTICA			
Shipper	'13, '14, '15	4-15	4-17	4-22
	PRUNUS INSITITIA			
Shropshire	'13, '14, '15	4-17	4-21	4-26
	PRUNUS TRIFLORA			
Berckmans	'07, '08, '13, '15	3-24	3-31	4-4
Abundance	'07, '08, '09, '13	3-25	3-31	4-4
Hale	'07, '08, '13	3-26	3-31	4-6
Burbank	'07, '08, '13, '15	3-27	4-1	4-5
Occident	'07, '08, '13, '15	3-25	4-2	4-7
Satsuma	'08, '09, '13, '15	3-30	4-4	4-8
Weeping Blood	'13, '15	3-30	4-4	4-8
Engree	'07, '08, '13	4-2	4-6	4-12
Kelsey	'08, '13, '15	4-2	4-6	4-12
Kerr	'07, '08, '13, '14, '15	4-3	4-8	4-12
Georgeson	'07, '08, '13, '14, '15	4-4	4-8	4-15
Chabot	'07, '08, '13, '14, '15	4-5	4-9	4-13
Red June	'13, '14, '15	4-6	4-10	4-14
Ogon	'07, '08, '13, '14, '15	4-7	4-11	4-17
Maru	'07, '08, '13, '14, '15	4-8	4-12	4-18
Delaware	'07, '08, '13, '15	4-8	4-14	4-19
Average of the Species		**4-1**	**4-6**	**4-11**
	PRUNUS AMERICANA			
Brittlewood	'07, '08, '13, '14, '15	4-17	4-22	4-27
	PRUNUS HORTULANA			
Dunlap	'07, '08, '13	4-12	4-17	4-22
Wayland	'07, '08, '13, '14, '15	4-17	4-22	4-27
Golden Beauty	'07, '08	4-19	4-23	4-27
Reed	'07, '08	4-19	4-23	4-27
Cumberland	'07, '08	4-19	4-23	4-28
Average of the Species		**4-17**	**4-22**	**4-26**

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TABLE VI—(*Continued*)

	Observations for the Years	First Bloom	Full Bloom	Last Bloom
	PRUNUS HORTULANA MINERI			
Maquoketa	'07, '08, '13	4-12	4-19	4-25
Forest Rose	'07, '08, '13	4-13	4-19	4-25
Nebraska	'07, '08, '13, '14, '15	4-17	4-22	4-27
Prairie Flower	'07, '08, '13, '14, '15	4-17	4-22	4-28
Average of the Species		**4-15**	**4-21**	**4-26**
	PRUNUS NIGRA			
Cheney	'07, '08	4-13	4-19	4-25
Smith Red	'08	4-14	4-20	4-25
Average of the Species		**4-14**	**4-20**	**4-25**
	PRUNUS ANGUSTIFOLIA WATSONI			
Strawberry	'07, '08, '13, '14, '15	4-11	4-17	4-23
	PRUNUS ANGUSTIFOLIA VARIENS			
Munson	'07, '08, '13, '14, '15	4-11	4-15	4-22
McCartney	'07, '08, '13, '14, '15	4-13	4-18	4-22
Yellow Transparent	'07, '08, '13, '14, '15	4-14	4-18	4-23
Lone Star	'07, '08, '13, '14, '15	4-15	4-20	4-25
Average of the Species		**4-13**	**4-18**	**4-23**
	PRUNUS MUNSONIANA			
Newman	'07, '08, '13, '14, '15	4-10	4-15	4-21
Whitaker	'07, '08, '13, '14, '15	4-13	4-17	4-23
Wild Goose	'07, '08, '13, '14, '15	4-13	4-18	4-24
Smiley	'07, '08, '14, '15	4-16	4-20	4-25
Cleveland	'07, '08, '13, '14, '15	4-16	4-20	4-26
Average of the Species		**4-14**	**4-18**	**4-24**
	HYBRIDS			
Climax	'07, '08, '13	3-25	3-31	4-5
Chalco	'07, '08, '13	3-28	3-31	4-6
Apple	'07, '08, '09, '13, '15	3-26	4-1	4-6
Nona	'07, '08, '13	3-27	4-2	4-7
Kelmyro	'07, '08, '13, '15	3-28	4-2	4-8
Doris	'07, '08, '13, '15	3-29	4-2	4-8
Kelbalan	'07, '08, '13, '15	3-28	4-4	4-8
Wickson	'07, '08, '09, '13, '15	3-28	4-4	4-8
Bartlett	'07, '08, '13	3-30	4-5	4-10

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TABLE VI—(*Continued*)

	Observations for the Years	First Bloom	Full Bloom	Last Bloom
	HYBRIDS—Continued			
Ragland	'07, '08, '13, '15	4-1	4-6	4-10
Red October	'07, '08, '13	4-1	4-6	4-10
Combination	'07, '08, '13, '15	3-30	4-7	4-14
Kelroba	'07, '08, '13, '15	4-1	4-7	4-10
First	'07, '08, '13, '14, '15	4-4	4-7	4-12
Shiro	'07, '08, '13, '14, '15	4-2	4-8	4-13
Waugh	'07, '08, '13, '15	4-4	4-8	4-12
Yates	'07, '08, '13, '15	4-4	4-9	4-14
Gonzales	'07, '08, '13, '14, '15	4-5	4-10	4-16
America	'07, '08, '13, '14, '15	4-5	4-10	4-17
Six Weeks	'07, '08, '13, '14, '15	4-6	4-11	4-18
Golden	'07, '08, '13, '15	4-7	4-11	4-18
Excelsior	'08, '13, '14, '15	4-10	4-14	4-19
Holland	'08, '13, '14, '15	4-10	4-14	4-20
Marianna	'07, '08, '13, '14, '15	4-12	4-16	4-20
Preserver	'07, '08, '13, '14, '15	4-12	4-16	4-21
Duke	'07, '08, '13	4-11	4-17	4-21
Milton	'07, '08, '13, '14, '15	4-12	4-17	4-20
Goose Dye	'07, '08, '13, '14	4-13	4-19	4-24
Idall	'08	4-12	4-20	4-24
Goose O	'07, '08, '13, '14, '15	4-14	4-20	4-25

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Pollination of Plums in General.

The principal use to which blooming data can be put is in the selection of suitable varieties for pollinating purposes. A brief discussion of the pollination of plums is in order in this connection. Plums are the most self-sterile of our cultivated fruits. While a few varieties are self-fertile under all conditions and others under favorable conditions it is best to proceed upon the assumption that all are self-sterile and provide for cross-pollination.

In selecting varieties to use as pollinizers it must be borne in mind that European plums are pollinated best by varieties of that group. Native and Japanese varieties, on the other hand, intercross readily and varieties of one group may be used to pollinate varieties of the other group. Hybrids may be expected to make good pollinizers for varieties belonging to either of the parent groups.

Bearing these principles in mind, two points must be given consideration in selecting a pollinizer. First, a variety that is valuable on account of its own fruit should be chosen. It is not necessary to select varieties with the sole idea of using them for pollinizers. The second point is the relative time of blooming. Varieties which come into full bloom at intervals greater than four days should not be expected to cross-pollinate successfully. The use that may be made of tables V and VI for the selection of suitable pollinizers is apparent. Suggestions as to suitable pollinizers for all varieties recommended for planting in the State are made along with their descriptions.

Varietal Descriptive Notes

Descriptions of the varieties of plums which fruited in the Station orchard are made short, concise, and non-technical as it is believed such descriptions are of more value than longer, more technical ones would be. More detailed descriptions of all the varieties of real value are to be found in the Plums of New York and other publications. An effort has been made to give an estimate of the value of each variety for planting in the state. This estimate may not seem to be in accordance with the preceding description of the tree and the fruit. Usually the reason for the conclusion as to the worth of a variety is to be found within the estimate itself. In any case, the estimate of a variety as here given may be considered of greater value to the prospective planter than the description. This is true because of the fact that the characters which determine the fitness or the unfitness of a variety for planting in the orchard are often so intangible as to defy description in terms habitually used for descriptive purposes. Descriptions found in nurserymen's catalogues usually give us the "truth" about a variety, but less often do they give the "whole truth" about it. If it is a shy bearer, drops badly when ripe, or is unusually susceptible to

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some disease such a fact can seldom be learned from the catalogue of the nurserymen. This unfortunate condition of affairs is responsible for a great many disappointments

European Plums.

Prunus domestica.

Shipper. Tree medium in size, open, upright, fairly productive. Fruit late, medium in size, roundish, dark purple; skin thin; stone semi-clinging; flesh light yellow, firm, sweet when fully ripe; quality only fair.

The quality of Shipper is so low that it is not advisable to plant it as it is surpassed in this and other respects by a number of domestica plums which were not grown in the Station orchard.

Prunus insititia.

Shropshire. Tree large, upright, productive, quite easily managed for a variety of the species. Fruit late, small, oval, blue; skin thin, tender; stone clinging; flesh greenish, firm juicy, subacid; quality fair.

Shropshire is a most reliable bearer and the fruit is good for culinary uses. This is a good damson for home and commercial planting.

Japanese Plums.

Prunus triflora.

Abundance. Tree large, upright, thrifty, very productive. Fruit early, large, roundish, unequal, bright red; skin thin, tough; stone clinging; flesh yellow, meaty, juicy, sweet; quality good.

Abundance bears large crops each year unless the blossoms are killed by spring frosts. It was one of the very earliest bloomers of all the varieties grown here. Abundance is worthy of a place in every plum orchard or collection of plum trees which includes any of the Japanese varieties.

Berckmans. Tree large, upright, thrifty, productive. Fruit early, large, roundish, bright red; skin thin; stone clinging; flesh yellow, meaty, juicy, sweet; quality good.

Berckmans is so very nearly like abundance that it is difficult to distinguish one from the other. Abundance, however, seems to be the better of the two.

Burbank. Tree low, spreading, open, productive. Fruit early, medium in size, roundish-conic, greenish-yellow overspread with red; skin thin; stone clinging; flesh yellow, juicy, meaty, sweet; quality fair.

Burbank ripens a few days after Abundance. The tree is not so good as that of the latter. As grown here, Abundance has been the

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better plum of the two, but Burbank is a close second. Many growers would prefer Burbank on account of a greater freedom from brown rot.

Chabot. Tree large, upright, spreading, open, productive. Fruit late, large, cordate, greenish-yellow, overspread with dark red; skin thick, tough; stone clinging; flesh yellow, juicy, meaty, sweet and rich; quality good.

Chabot is undoubtedly one of the very best of the Japanese plums. It is large, the quality is good, brown rot does not affect it so much as most varieties of the group, and it is a good shipper. Its season of ripening, however, causes it to come into competition with peaches, and for this reason it is not likely to be a valuable commercial variety.

Delaware. Tree small, upright, fairly productive. Fruit midseason, medium in size, roundish, dark red with dull white bloom; skin thick, tough; stone small, free; flesh pale yellow, moderately juicy, meaty, very mild sub-acid, pleasant; quality fair.

Two reasons may be given for not recommending Delaware for either home or commercial planting. The tree is a poor grower, and the quality of the fruit is low.

Engree. Tree medium in size, upright, close topped, productive. Fruit early, small to medium in size, roundish, flattened endwise, dark purplish red; skin thick, tough; stone clinging; flesh yellow, juicy, melting, sub-acid near the stone, sweet next to the skin; quality poor.

Notwithstanding the earliness and the productiveness of Engree it is not worth growing on account of its very low quality.

Georgeson. Tree medium in size, somewhat spreading, inclined to be unproductive. Fruit early, medium in size, roundish-cordate, greenish-yellow; skin thick, tender; stone clinging; flesh yellow, juicy, firm, subacid; quality fair.

Georgeson has nothing to recommend it.

Hale. Tree medium in size, upright, open, unproductive. Fruit early, medium in size, roundish, yellow; skin thin; stone clinging; flesh yellow, juicy, melting, mild subacid; quality fair.

Hale is another variety that should never be planted, for besides being unproductive the quality of the fruit is low and it rots badly.

Kelsey. Tree large, upright, vigorous, tender. Fruit late, large, roundish-cordate, yellow overspread with light red; skin thin, tender; stone small, clinging; flesh yellow, juicy, meaty, rather pleasant, sweet; quality good.

Kelsey is too tender to succeed here, but probably it is hardy enough to plant in the warmer sections of the State where it may be grown for home use.

Kerr. Tree large, upright, open, productive. Fruit early, medium in size, cordate, yellow; skin thick, tough; stone clinging; flesh yellow, meaty, subacid; quality good.

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While Kerr is one of the best of the Japanese plums in the quality of its fruit, it is small, unless carefully thinned, and its color is unattractive. We cannot recommend it for planting in Maryland.

Maru. Tree small, spreading, a poor grower, productive. Fruit early, medium in size, roundish-oblate, dull, purplish red over yellow; skin thin, tough; stone clinging; flesh yellow, juicy, meaty, subacid; quality only fair.

Maru is one of the latest blooming Japanese plums, and for this reason it often escapes the spring frosts here when other varieties of the group are killed. It is not worth planting for its fruit, however, and whatever value it may have is for breeding purposes.

Occident. Tree medium in size, open, inclined to be spreading, fairly productive. Fruit early, very large, roundish, halves somewhat unequal, dull red with a heavy bluish bloom; skin thick, tough; stone clinging; flesh blood red, juicy sweet; quality fair.

Occident may be best characterized as a novelty. It is interesting and the amateur is likely to want to add it to his collection, but it is not a profitable variety.

Ogon. Tree medium in size, upright-spreading, a poor grower, unproductive. Fruit mid-season, medium in size, roundish, yellow; skin thin, tough; stone free; flesh pale yellow, firm, meaty, sweetish, flat; quality fair.

The unusual characteristic of being a free stone cannot counterbalance the shy bearing and the low quality of fruit of Ogon. It is not worth planting.

Red June. Tree large, upright-spreading, hardy, productive. Fruit early, medium in size, roundish-cordate, yellow overspread with dark copper-colored red; skin thin; stone small, semi-clinging; flesh yellow, juicy, meaty, sweet; quality fair.

Red June is one of the best Japanese plums. It blooms late, matures early, is productive and comparatively free from rot. It gets on the market before the bulk of the peach crop, thus bringing a better price than later varieties.

Satsuma. Tree medium in size, upright-spreading, fairly productive. Fruit mid-season, large, roundish-cordate, greenish-yellow overlaid with dark red; skin thick, tough; stone clinging; flesh dark blood red, juicy, firm, meaty, subacid to acid; quality fair.

Satsuma is the best known red-fleshed Japanese plum. If well grown and not allowed to rot, Satsuma should sell well. It is not very productive when young, but becomes more so with age.

Weeping Blood. Tree dwarf, drooping, unproductive. Fruit mid-season, small, roundish, red; skin thick; stone clinging; flesh red, fibrous, juicy, subacid; quality fair to good.

Weeping Blood is one of those varieties that gets upon the market because of unusual characteristics; not because of desirable ones. Its only use is as an ornamental and it is only a poor ornamental.

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NATIVE PLUMS.

Prunus Americana.

American Eagle. This variety died before either blooming or descriptive notes of it were obtained. All such varieties are included here in order to show that they were planted. The fact that a variety did not reach maturity does not necessarily mean, of course, that it was inherently weak.

Brittlewood. Tree small, spreading, poor grower, unproductive. Fruit mid-season, medium in size, roundish, flattened endwise, greenish-yellow overlaid with bright red; skin thick, tough; stone large, clinging; flesh yellow, juicy, fibrous, meaty, subacid, astringent next to stone; quality fair.

Brittlewood was one of the most worthless plums grown in the Station orchard.

Stoddard. Died before either blooming or descriptive notes were obtained.

U. S. Died before either blooming or descriptive notes were obtained.

Prunus hortulana.

Benson. Died before either blooming or descriptive notes were obtained.

Cumberland. Died before either blooming or descriptive notes were obtained.

Dunlap. Tree large, spreading, fairly productive. Fruit mid-season, small, roundish-oval, beautiful, bright red; skin thin, tough; stone large, clinging; flesh yellow, melting, juicy, sweet; quality fair.

Dunlap is better than a great many plums that are not recommended for planting, but it is too small and too low in quality to entitled it to a place in any list for Maryland.

Golden Beauty. Died before descriptive notes were obtained.

Reed. Died before descriptive notes were obtained.

Wayland. Tree, large, spreading, open, productive. Fruit very late, small, roundish, bright red; skin thick, tough; stone clinging; flesh yellow, juicy, meaty, subacid; quality fair.

On account of its freedom from disease, hardiness, very late ripening and excellent culinary qualities, Wayland is recommended for home use.

Prunus hortulana mineri.

Forest Rose. Tree medium in size, upright-spreading, fairly productive. Fruit late, medium in size, oval, bright red; skin thick, tough; stone rather large, clinging; flesh yellow, fibrous, juicy, sweet near surface, subacid near stone; quality good.

Forest Rose has proved itself one of the best native plums grown in the Station orchard. The fruit is of good size and high quality,

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and the season of ripening late. When to these desirable qualities is added the hardiness of the species we have a valuable variety.

Maquoketa. Tree medium in size, spreading, open, only fairly productive. Fruit late, small, roundish-ovate, dull red; skin thick, tender; stone clinging; flesh yellow, juicy, fibrous, sweet near the skin, astringent near the center; quality fair.

Maquoketa is in no way superior to Forest Rose and is not its equal in either size or quality of fruit.

Nebraska. Tree medium in size, spreading, productive. Fruit late, small, roundish-ovate, red; skin thin, tough; stone clinging; flesh yellow, juicy, fibrous, meaty, subacid, sweet near skin; quality good.

The fruit of Nebraska is small and rather unattractive. The tree is not a good grower. Both Forest Rose and Prairie Flower are better.

Prairie Flower. Tree large, spreading, productive. Fruit late, small to medium in size, roundish-oval, light yellow overspread with red; skin thin, tough; stone large, clinging; flesh yellow, juicy, meaty, sweet; quality good.

As grown here Prairie Flower is a close second to Forest Rose but hardly its equal.

Prunus nigra.

Cheney. Died before descriptive notes were obtained.

Smith Red. Died before descriptive notes were obtained.

Prunus angustifolia watsoni.

Strawberry. Tree very small, spreading, unproductive. Fruit early to mid-season, small, roundish, red; skin thin; stone clinging; flesh yellow, soft, insipid; quality poor.

Nothing is added to the sum of desirable qualities of plums by Strawberry. By some it is considered an ornamental, but it could hardly be called one worthy of the name as grown in the Station orchard.

Prunus angustifolia varians.

Lone Star. Tree small, spreading, unproductive. Fruit early, small, oval, red; skin thin; stone clinging; flesh yellow, juicy, sweet; quality fair.

Lone Star is surpassed by others of the same sub-species.

McCartney. Tree medium in size, upright, open, productive. Fruit early, small, oval, golden yellow; skin thin; stone large, clinging; flesh yellow, juicy, fibrous, sweet; quality good.

McCartney is an early, productive plum which seldom misses a crop, but it rots badly and is too soft to ship well. The color, too, is not in its favor, so it cannot be recommended for Maryland.

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Munson. Tree large, spreading, open, productive. Fruit early, medium in size, long oval, bright red; skin thin; stone clinging; flesh yellow, juicy, fibrous, sweet; quality fair.

Munson is early, attractive, and a reliable bearer. It is unquestionably one of the best plums of its species, and may be planted with confidence in its suitability for home use and the local market.

Yellow Transparent. Tree medium in size, upright-spreading, open, productive. Fruit mid-season, small, oval, pale yellow; skin thin, tough; stone clinging; flesh yellow, melting, juicy, flat; quality fair.

Yellow Transparent is not so high in quality as Munson or McCartney. It also drops very badly.

Prunus munsoniana.

Cleveland. Tree large, spreading, vigorous, only fairly productive. Fruit early, large, oval, light red; skin thin; stone clinging; flesh yellow, juicy, fibrous, sweet; quality fair.

Cleveland very closely resembles its parent, Wild Goose, but is inferior to it on the whole.

Newman. Tree large, spreading, dense-topped, productive. Fruit mid-season, small, oval, bright red; skin thick, tough; stone clinging; flesh yellow, melting, fibrous, mild subacid; quality fair.

Newman is a very dependable plum. It is worth growing for its fruit in addition to being one of the very best pollenizers for all varieties of related species.

Smiley. Tree large, spreading, open, productive. Fruit mid-season, medium in size, oval, dark red; skin thick, tough; stone large, clinging; flesh yellow, juicy, fibrous, sweet and pleasant except near stone; quality good.

There is no place in the orchard for Smiley on account of the fact that it ripens with Wild Goose which is a better plum in all respects.

Whitaker. Tree large, spreading, open, productive. Fruit mid-season, medium in size, roundish-oval, bright red; skin thin, tough; stone clinging; flesh yellow, juicy, meaty, sweet; quality good.

Whitaker is one of the very best plums of its type. It should prove itself worthy of wide planting as it is superior to Wild Goose, the most extensively planted of all our native plums.

Wild Goose. Tree very large, spreading, hardy, productive. Fruit early, medium in size, oval, bright red; skin thin, tough; stone clinging; flesh yellow, melting, juicy, fibrous, sweet next to the skin, acid next to the stone; quality fair.

Wild Goose is attractive, has a pleasing flavor, ships well, is free from disease, and is very productive. Its wide popularity is based upon these excellent qualities and it will be grown extensively for years to come.

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Hybrids.*

America. Tree large, upright-spreading, open, hardy, very productive. Fruit early, medium to large in size, roundish-oval, bright, golden yellow, almost completely overspread with bright red; skin thick, tough; stone large, clinging; flesh yellow, moderately firm, juicy, mild, subacid; quality fair.

America proved itself one of the very best plums grown in the Station orchard. It should be widely planted in Maryland, and might well displace many better known varieties.

Apple. Tree medium in size, upright-spreading, only fairly productive. Fruit mid-season, large, roundish-oblate; deep purplish red; skin tough; stone small, clinging; flesh dark red, juicy, meaty, sweet, pleasant; quality good.

Apple is an interesting plum likely to be planted by the "plum crank," but not by the grower who is looking primarially for financial returns. It somewhat resembles but is inferior to Satsuma. It seems very susceptible to brown rot.

Bartlett. Tree small, upright, open, only fairly productive. Fruit early, large, cordate, dark purplish red; skin thin, tender; stone clinging; flesh, rich yellow, melting, juicy, fibrous, sweet, spicy, pleasant; quality good.

Bartlett is rather unproductive and quite susceptible to brown rot. While it has a peculiar though pleasing flavor, it does not possess those qualities that go to make up a desirable plum.

Chalco. Tree medium in size, upright, productive. Fruit mid-season, large, oblate, dull wine-colored; skin thick, tough; stone small, clinging; flesh light yellow, juicy, meaty, sweet, vinous; quality fair.

In spite of the large size and attractive appearance of Chalco it is fit only for amateur culture.

Climax. Tree large, upright-spreading, fairly productive. Fruit early, large, cordate, pale yellow, almost completely overspread with dark, dull red; skin thin, tough; stone clinging; flesh yellow, juicy, somewhat fibrous, mild subacid; quality good.

Climax would be a very valuable plum if it were not so sensitive to attacks of brown rot, for it is early, large and attractive. It may be worth planting in the home orchard, but it is not fit for commercial planting.

Combination. Tree medium in size, upright, only fairly productive. Fruit early, medium in size, roundish, bright red; skin thin; stone clinging; flesh yellow, juicy, mild subacid; quality fair.

Combination lacks quality to such a marked degree that it cannot be given a place in the plum orchard. It also rots badly.

Doris. Tree medium in size, upright-spreading, unproductive. Fruit mid-season, small to medium in size, roundish, dark red; skin

*The parentage of hybrid varieties may be found by referring to Table IV.

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thin, tough; stone clinging; flesh yellow, moderately juicy, meaty, very mild subacid; quality fair.

Doris is a worthless variety. It is small, unattractive, bears little fruit and the quality of that little is low.

Duke. Tree large, spreading, open, productive. Fruit mid-season, small, oval, bright red; skin thin, tough; stone large, clinging; flesh yellow, juicy, meaty, mild subacid; quality fair.

Duke resembles Wild Goose, but is not its equal in any character unless it is in quality. The plum industry will never miss it.

Excelsior. Tree large, spreading, open, productive. Fruit early, medium in size, roundish-cordate, dark red; skin thin, tough; stone clinging; flesh yellow, juicy, firm, sweet; quality fair.

Excelsior has not lived up to its name here. It should have no place in the plum growing industry of Maryland.

First. Tree medium in size, upright-spreading, only fairly productive. Fruit very early, medium in size, roundish, dull red; skin thin, tender; stone clinging; flesh yellow, juicy, fibrous, sweet; quality fair to good.

There are two very serious defects which characterize First. While it is one of the very earliest maturing plums, the fruit is unattractive and the tree unprolific.

Golden. Tree small, upright-spreading, unproductive. Fruit mid-season, medium in size, roundish-oblate, golden yellow with a pink blush when ripe; skin thin, tough; stone small, clinging; flesh yellow, juicy, mild subacid; quality good.

Golden is not a reliable bearer and it rots badly. In spite of some good qualities it fails to meet the requirements which would place it in the better class of plums.

Gonzales. Tree medium in size, spreading, open, very productive. Fruit mid-season, medium in size, roundish-oblate, pale yellow overlaid with bright or purplish red; skin thin, tough; stone small, clinging; flesh yellowish-red, melting, juicy, meaty, rich, sweet; quality excellent.

As grown at the Station Gonzales was one of the best plums in the orchard. The habit of tree growth might be better, but it is an unusually reliable bearer. The fruit is not only attractive, but the quality is high also. It should be given a trial for both home and commercial planting.

Goose Dye. Tree medium in size, spreading, vigorous, unproductive. Fruit mid-season, medium in size, roundish-oblong, dull red, with indistinct purple stripes and patches; skin thick, tough; stone large, clinging; flesh yellow, juicy, melting, meaty, mild subacid, spicy; quality good.

The undesirable character of the tree growth and the unproductiveness of Goose Dye make it unfit for use in the plum orchard, large or small.

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Goose O. Tree medium in size, spreading, unproductive. Fruit mid-season, small, roundish-ovate, yellow, with light red blush; skin thin, tough; stone semi-clinging; flesh yellow, juicy, meaty, mild subacid; quality fair.

The fruit of Goose O is too small and too low in quality to be of any value.

Holland. Tree large, upright-spreading, vigorous, only fairly productive. Fruit mid-season, medium in size, roundish, pale golden yellow, with pink blush; skin thin, tough; stone clinging; flesh yellow, juicy, somewhat meaty, sweet, vinous; quality fair.

The quality of Holland is too low and its appearance too unattractive for it to be given a place in either the home or the commercial orchard.

Idall. Died before descriptive notes were obtained.

Kelbalan. Tree small, upright, open, unproductive. Fruit mid-season, medium in size, roundish, greenish-yellow; skin thick, tender; stone clinging; flesh yellow, juicy, meaty, sweet; quality fair.

All of its characteristics considered, Kelbalan is a very poor plum.

Kelmyro. Tree small, upright-spreading, only fairly productive. Fruit mid-season, medium in size, roundish, yellow, mottled with dark purplish red; skin thin, tough; stone clinging; flesh yellow, melting, juicy, fibrous, sweet; quality fair.

Kelmyro should have no place in Maryland plum culture.

Kelroba. Tree medium in size, upright-spreading, only fairly productive. Fruit mid-season, medium in size, roundish, pale greenish-yellow; skin thin, tough; stone clinging; flesh yellow, juicy, fibrous, sweet; quality fair.

The parentage of Kelroba, Kelmyro and Kelbalan is the same. They resemble each other very closely. None of them is fit for planting.

Marianna. Tree large, spreading, open, very unproductive. Fruit early, small roundish-oval, light red, changing to dark red; skin thin, tough; stone large, clinging; flesh yellow tinged with red under the skin, juicy, fibrous, watery; quality poor.

The quality of the fruit of Marianna is so low that it is absolutely worthless. Its only use is as a source for stocks.

Milton. Tree large, spreading, productive. Fruit early, small, oval, dark red; skin thin; stone clinging; flesh yellow, melting, fibrous, mild subacid; quality fair.

Milton resembles its parent, Wild Goose. It ripens earlier however, and should be planted wherever a plum of this type is desired.

Nona. Tree large, upright, open, productive. Fruit early, large, oval, yellow overspread with dark red; skin thick, tough; stone large, clinging; flesh yellow, mottled with red, juicy, fibrous, sprightly subacid; quality fair.

Nona is an inferior plum. The quality is low and the brown rot readily attacks it every year.

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Preserver. Tree medium in size, upright-spreading, only fairly productive. Fruit mid-season, small to medium in size, roundish, yellow washed with dark purplish red; skin thin, tough; stone clinging; flesh red, juicy, fibrous, sweet near the skin, acid near the stone, astringent; quality poor.

The quality of Preserver is so very low that it is doubtful whether it would make even a fair cooking plum. In addition to this very serious fault it is a rather shy bearer.

Ragland. Tree medium in size, upright-spreading, productive. Fruit mid-season, medium in size, roundish-oblate, yellow, rarely a faint reddish blush; skin thin, tender; stone small, clinging; flesh yellow, juicy, fibrous, sweet, subacid next to stone; quality fair.

Ragland is unattractive in color and low in quality. It is inferior to other varieties of its type and season.

Red May. Died before either blooming or descriptive notes were obtained.

Red October. Tree large, spreading, open, productive. Fruit very late, medium in size, roundish, dark red; skin thick, tough; stone clinging; flesh yellow, juicy, fibrous, subacid; quality fair.

Red October was the latest maturing plum grown in the Station orchard. Its season extends to the middle of September. Where it is desirable to prolong the plum season as late as possible this variety should be used for that purpose.

Shiro. Tree large, upright-spreading, productive. Fruit early, large, roundish-ovate, clear bright yellow; skin thin, tough; stone clinging; flesh yellow, translucent, juicy, fibrous, sweet; quality fair.

The low quality of Shiro and its susceptibility to brown rot make it an unprofitable plum even for home use.

Six Weeks. Tree medium in size, spreading, fairly vigorous, only fairly productive. Fruit early, medium in size, roundish-oblong, yellow with rich red blush; skin thick, bitter; stone small, clinging; flesh yellow, juicy, somewhat fibrous, flat; quality poor.

The only thing that can be said in favor of Six Weeks is that it matures early. It is quite susceptible to brown rot, drops when ripe, and is very low in quality even for a plum of its season.

Watson. Died before descriptive notes were obtained.

Waugh. Tree large, upright-spreading, rather open, productive. Fruit mid-season, medium in size, roundish, dark red; skin thin, tough; stone large, clinging; flesh pale yellow, juicy, fibrous, mild subacid, sour near stone; quality fair.

Waugh closely resembles a number of Japanese varieties, but is hardly their equal. Its planting in Maryland is not recommended.

Wickson. Tree large, upright, vigorous, very unproductive. Fruit mid-season, large, cordate, yellow overspread with dark red; skin thin, tender; stone small, clinging; flesh yellow, juicy, meaty, sweet; quality good.

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Wickson is one of the largest and most attractive of all our plums. It is a very shy bearer, however, and should be planted by the amateur only.

Yates. Tree medium in size, upright, unproductive. Fruit mid-season, small, roundish-oblate, dull yellow with a bright red blush; skin thin, tough; stone clinging; flesh yellow, juicy, fibrous, meaty, sweet, pleasant; quality fair.

Yates is unproductive and quite susceptible to brown rot. It should not be planted in this State.

FUTURE OF THE INDUSTRY.

There can be but little if any doubt that plums should be grown more largely in Maryland than they are at present.

The almost universal decline of plum growing in the State should be arrested if possible. There are few farms, indeed, that should not carry enough trees to afford an abundant supply for home uses. Many farms might well grow enough to supply the local markets.

Few fruits grown within the State offer a wider range of possibilities for home use. Besides being good for eating out of hand, plums may be used for cooking in a number of ways. The failure to realize this fact accounts for plums not being grown more widely for home use, at least, if not for market.

Essentials of Success.

In order to grow plums successfully, a few essentials must be observed. Briefly these are as follows: the selection of a few suitable varieties; the selection of a proper site; and good orchard management, which includes cultivation, thinning, spraying for disease and insect control and observance of fundamental marketing principles. These questions can be discussed only briefly in this bulletin. If more detailed information is desired it will be supplied upon application.

Principles of Varietal Selection.

Success in the growing of plums is dependent, among other things, upon having the proper varieties. The often asked question of what varieties to plant is very largely a local, and to some extent a personal one. As a general rule it is safe to plant any variety that is known to succeed for the purpose in mind in the same locality. If two, or more, varieties succeed equally well the one which is liked better should be planted; if planting for the market select varieties demanded by the consumer; if planting for home use personal preference should be followed.

Certain qualities should characterize all varieties that may be planted. They should be hardy to cold. That is, a variety should not fail to produce a crop more often than the average of all varieties on account of either severe cold of winter or late spring frosts. They

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should be inherently productive. Shy bearers should be avoided. They should not be unusually susceptible to disease. Varieties otherwise highly desirable may rot so badly as to be practically worthless.

Varieties Recommended for Planting in Maryland.

With the principles and qualities mentioned above in mind, a list of varieties, described in a non-technical manner, are suggested as suitable for growing in the State. While all such lists are somewhat tentative, it is believed that those recommended herewith will prove satisfactory within the limits pointed out. If they were grown to the exclusion of all other varieties it is believed that the plum growing industry of the State would be benefitted enormously and its decline cease.

*Abundance—*Japanese.*

The tree of Abundance is large, vigorous, unusually productive, and it seems well adapted to all types of soil. Burbank is a suitable pollinizer. The fruit is large, bright red, sweet and good in quality. The season of maturity is early and short.

Abundance is not a good shipper and sometimes brown rot proves very destructive. It cannot be recommended for commercial planting. In the two eastern divisions of the State it should be planted for home use in spite of its shortcomings.

*America—*Hybrid (Robinson *Abundance.)*

If the best variety in the Station plum orchard can be named it is America. The tree is vigorous, hardy, and unusually productive. The bearing of heavy crops does not seem to tax its vitality like it does that of the Japanese varieties. Red June, Gonzales, Chabot or Newman are suitable pollinizers. The fruit is early, of good size and very attractive in color. While America is not high enough in quality to be classed as a dessert plum, it is good for cooking purposes.

On account of its general vigor, productiveness, and comparative freedom from brown rot it is worthy of a place in both home and market plantings throughout the State. Kerr recommended it for commercial planting.

Berger—*Japanese.*

Berger is an unusual variety. It is a vigorous, upright grower, with distinctively, light-colored foliage. Unfortunately, it is an early bloomer and Abundance, Burbank, or some other early blooming variety must be used as a pollinizer. The fruit is characteristically distinct. It is unlike any of the other Japanese varieties in flavor, somewhat resembling the European varieties in this respect. The fruit, which is very early, looks like a large, red cherry. The stone is small and free.

*Varieties of this list marked with an * are also described in the list of those grown in the Station orchard in the preceding pages.

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No variety will so diversify a collection of plums and every home planting should include one tree. Its recommendation by Kerr is assurance that it is more than a worthless novelty.

*Burbank—*Japanese.*

One objection to Burbank is its low, spreading habit of growth. For this reason, perhaps, Abundance is generally considered the better of the two. The fruit of Burbank ripens a few days after that of Abundance, and while there may not be so much, it is freer from brown rot. Abundance should be grown as a pollinizer.

Its planting throughout the Piedmont and the Coastal sections of the State for home use is recommended. It may prove profitable for market also, but should be planted cautiously for this purpose.

*Chabot—*Japanese.*

Chabot is a strong, uprght grower, and while it is not as productive as some of the other Japanese varieties it bears a fair amount of fruit. For pollination use America, Gonzales, or Red June. The large, heart-shaped, red fruit is very attractive in appearance. The fruit matures about mid-season and the period of maturity is a long one, necessitating two or more pickings.

While Chabot comes into competition with the bulk of the peach crop and for this reason may not always bring a high price upon the open market, Mr. Kerr's recommendation that it be planted commercially throughout the entire State except the Appalachian region is believed to be sound.

Downing—*Wild Goose Group.*

The tree of Downing is large, vigorous and productive. It is hardy enough to withstand the cold of any portion of the State. Either Newman or Milton will insure pollination. The fruit is of good size for its group, the appearance is attractive and the quality is good. It matures in mid-season.

Mr. J. W. Kerr considered Downing one of a few varieties that were profitable commercially. It is one of the best plums of its group and should be more widely planted throughout Maryland.

German Prune—*European (domestic).*

The tree of German Prune is better than the fruit, and the characters of the former rather than those of the latter have made it so popular. The tree is vigorous, hardy and very productive. Of the list of plums recommended herewith Shropshire and Green Gage are the best pollinizers, though Newman may aid in pollination. The tart, medium-sized fruit is unexcelled for culinary purposes. It may be cured into a good, though small prune. It matures late.

So long as the plum industry of the State remains in its present state of development German Prune is the best domestic plum for growing in the Appalachian and Piedmont sections. When it becomes more intensive others may displace it.

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*Gonzales—*Hybrid (Japanese, native).*

One of the best varieties of plums grown in the Station orchard was Gonzales. While the tree is only medium in size and spreading, in habit of growth it is very productive. Chabot, America and Red June bloom at the same time and any of them would make a good pollinizer. The fruit is large, attractive in appearance and its quality is excellent.

Gonzales should be planted in every part of the State, except at the highest altitudes, for both home and market. It is worthy of a thorough trial.

Green Gage—*European (domestica).*

The trees of Green Gage while not large are well shaped, vigorous, hardy and productive. The fruit is the standard of excellence for plums although it is neither large nor attractive in color. It matures about mid-season. German Prune and Shropshire both insure its pollination.

While Green Gage does not possess the character of a market variety, its high quality and excellence for culinary uses place it among the most desirable varieties for home use. It should succeed in all parts of the State except the Coastal Plain.

*Milton—*Hybrid (Wild Goose?)*

Milton is an early maturing, medium-sized, distinctively shaped, attractively colored plum. The quality of the fruit is fair or better and it is unusually free from brown rot. The tree grows well and is very productive. Newman and Wild Goose are good pollinizers.

While it is of hybrid origin, one of its parents is Wild Goose and it resembles varieties of that group. It should be planted throughout the State as a commercial variety. Mr. Kerr placed it at the head of a list of commercial plums for Maryland.

*Newman—*Wild Goose Group.*

The orchard characters of the tree of Newman are all that could be desired. The firm, red fruit is an old standard which ships well. It is small and the quality is not high, however. It matures about mid-season. Any variety of its group is a suitable pollinizer.

While Newman has considerable intrinsic value on account of its fruit, undoubtedly its strongest claim to a place in the plum orchard lies in the excellence of its character as a pollinizer. It was highly recommended for this purpose by the late Mr. Kerr.

*Red June—*Japanese.*

The tree of Red June is large, hardy and productive. The blooming season is late for a Japanese variety and the fruit is early—ten days before Abundance. Its cross-pollination will be provided for by growing Chabot, Gonzales or America with it. The fruit is distinctive in shape and attractive in appearance.

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Red June should prove a valuable market variety in the Piedmont and Coastal Plain regions of the State as it gets upon the market early, ships well, and is rather resistant to brown rot.

Shropshire—*European (damson).*

The wide popularity of Shropshire is due very largely to the highly desirable characters of the tree. It is large, vigorous and hardy. Shropshire is the standard of reliability and productiveness for plums of all kinds. Either German Prune or Green Gage is a good pollinizer. The fruit, like that of all damsons, is small and the quality fair. The season of maturity is late.

Shropshire may be safely planted in all parts of the State for both home and market use. It is very widely planted already.

*Whitaker—*Wild Goose Group.*

Whitaker resembles its parent, Wild Goose, very closely. As grown here it produced good crops of fruit which is large, bright red, tough skinned, and of good quality. It should ship well, and matures in mid-season. Newman, Milton, and Wild Goose are all suitable for cross-pollination.

Although closely resembling Wild Goose, Whitaker is believed to be the better of the two, for which reason it should be thoroughly tested throughout the State. The late Mr. Kerr placed Whitaker second in his list of plums for commercial planting in Maryland.

*Wild Goose—*Wild Goose Group.*

While some plums of its group may be superior to Wild Goose, it is still worthy of planting throughout the State for home use. Wild Goose is so well known that it is hardly worth while to give any description of it. Unless cross-pollination is provided for it is a very shy bearer. Use any other variety of its group for this purpose.

The Orchard Site.

A suitable site for the planting of the trees—few or many—should be selected whenever possible. Of all the factors to be considered in choosing the orchard site none should be given greater weight than that of air drainage. The ground need not be sloping, but there should be lower land nearby upon which the cold air may settle without hindrance. It is useless to plant trees in frost pockets no matter how favorable other conditions of the site may be. The direction of the slope with reference to the point of the compass is of minor importance. Other conditions being equal an eastern or a southeastern exposure is usually preferable.

Good soil drainage should not be neglected, and it is well to remember that sloping land is not necessarily well drained. While it is true that some types of plums thrive upon moist clay soils, a well-drained soil is necessary for the highest degree of success with all types.

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Orchard Management.

Lack of soil-moisture rather than lack of plant food is usually the limiting factor in the growth of both wood and fruit of plums, as of other orchard fruits. In order to overcome this condition cultivation or some other means of conserving the soil-moisture must be resorted to. A dust or other mulch hinders direct evaporation from the soil and prevents the growth of weeds which transpire large amounts of water. A dust mulch, two to four inches deep, should be maintained from early in the spring till the middle of July or the first of August, at the end of which period a cover crop should be sown for plowing down the following spring. Under some conditions it may be desirable to use a straw mulch instead of one of dust. Whatever kind of cultural treatment may be given plums it should insure an adequate amount of soil-moisture at all times.

Good fruit can seldom if ever be grown without spraying. Spray intelligently for otherwise the material and labor are lost. Spray thoroughly; at the proper time; and with the right spray material for the control of the disease or the pest menacing the trees or the fruit. These are the three essentials of successful spraying. Adhere rigidly to all of them.

There are only two diseases of the plum that often cause serious loss in Maryland. They are brown, or ripe, rot and black knot. Other fungous diseases are effectively held in check by the treatments recommended as necessary for controlling them. Two insects may become really serious. They are the San Jose scale and the curculio. All of them except brown rot may be controlled by the proper spray treatments with a high degree of success. Brown rot, too, may be held in check effectively if only the right varieties are grown and then carefully thinned and sprayed.

The treatments usually necessary may be outlined as follows:

Concentrated lime-sulphur (1 part of lime-sulphur to 9 parts of water) when the buds begin to swell. Self-boiled lime-sulphur and arsenate of lead just after the petals fall and again three weeks later. Additional applications of self-boiled lime-sulphur should be made at intervals of three weeks until two or three weeks before picking.

Thinning fruit is often neglected when other operations of successful orchard management are carried out with great care. Plum growing may be a failure rather than a success because thinning is neglected. It increases the size, color, and quality of the fruit; hinders the spread of brown rot; and destroys numerous curculio larvae. It also prevents the drain upon the vitality of the tree incident to overbearing.

Thinning should be done immediately after the June drop. Do not fear the removal of too much fruit. When it matures it will be found to be much thicker than it was thought to be at the time of thinning. Usually the individual plums should be left about four inches apart.

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Picking, Packing and Marketing.

Plums ought to be picked before they are fully ripe—Japanese varieties a week, others three or four days. Whatever the package used for marketing plums, it should be honestly and carefully packed and every detail of neatness should be carefully observed. Develop the local market, if possible, either by selling direct to the consumer or to the local grocerymen. In no other phase of the fruit industry has the grower so great an opportunity for exercising business ability as in the marketing of his product. Unless he can do this successfully his business must necessarily be a failure.

SUMMARY.

1. Plums are not grown extensively in Maryland, being limited entirely to production for home use and local market.

2. At this time the industry is upon the decline, on account of the low prices obtainable for the product, the growing of unsuitable varieties in many instances, and the ravages of fungous diseases and insect pests.

3. The varieties being most widely grown are Abundance, Shropshire, Burbank, Wild Goose, Red June, Lombard, German Prune, Satsuma, Shipper, and Green Gage. A great many other varieties are also grown, however.

4. A number of Native, Japanese, and hybrid varieties have been tested at the Station in order to determine their suitability for growing in the State.

5. Blooming data for the varieties grown at the Station show the blooming period of the Japanese varieties normally to extend approximately over the first half of April; that of Natives, over the latter half; and that of hybrids over the entire month.

6. Cross-pollination of plums is necessary in order to be sure of obtaining a crop. Blooming data given enables the selection for this purpose of varieties blooming at the same time.

7. Short, non-technical descriptions and estimates of the value of the varieties which fruited in the Station orchard are given.

8. While the commercial planting of plums is not recommended, it is believed that every farm should grow enough for home use and many might well grow them for the local trade as well.

9. The essentials of success are selection of suitable varieties, the selection of a proper orchard site, good orchard management, and, when grown for sale, right methods of picking, packing and marketing.

10. The list of varieties recommended for planting in the State includes Abundance, America, Berger, Burbank, Chabot, Downing, German Prune, Gonzales, Green Gage, Milton, Newman, Red June, Shropshire, Whitaker, and Wild Goose.

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" "	73, April.,	1901,	Suggestions About Combatting the San Jose Scale.
" "	87, Nov.,	1902,	The Periodical Cicada or Seventeen-Year Locust.
" "	90, Dec.,	1903,	The San Jose Scale.
" "	91, Feb.,	1904,	Experiments with Nitrogenous Fertilizers.
" "	92, Mar.,	1904,	Notes on Apple Culture.
" "	93, May,	1904,	Pithiness in Celery.
" "	94, July,	1904,	Systems for Keeping Milk and Butter Records.
" "	95, Aug.,	1904,	Character of Milk During the Heat Period.
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" "	119, July.,	1907,	Greenhouse Pests in Maryland.
" "	147, Aug.,	1910,	Wheat—Variety Test, Smut and Scab.
" "	149, Dec.,	1910,	The Terrapin Scale
" "	151, Feb.,	1911,	Fertilizers for Asparagus.
" "	154, June,	1911,	Bee Keeping in Maryland.
" "	155, Aug.,	1911,	Maryland Weeds and Other Harmful Plants.
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" "	160, Oct.,	1911,	Strawberries.
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" "	206, April,	1917,	The Hothouse Milliped.

EXTENSION BULLETINS.

Bulletin No.	1, Sept.,	1916,	Maryland Apple Grading and Packing Law.
" "	2, Oct.,	1916,	Relation of Lime to Agriculture.
" "	3, Feb.,	1917,	The Garden.
" "	4, May,	1917,	Federal Farm Loan Act and the Farmer.
" "	5, May,	1917,	Garden Record Book.

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